

REQUEST FOR RECONSIDERATION

Claims 1-20 remain be active in this application.

The claimed invention is directed to a process for preparing autocatalytic polyether alcohols.

Autocatalytic polyether alcohols have been used in the preparation of polyurethanes. Autocatalytic polyether alcohols may contain tertiary amino groups which catalyze the urethane reaction and avoid the use of a separate tertiary amine catalysts which can migrate out of the polyurethane and create an unpleasant odor. In spite of avoiding the problem of migration associated with using a separate tertiary amine catalyst, autocatalytic polyether alcohols have typically prepared have suffered from an odor problem with the polyurethanes and unsatisfactory age resistance for the polyurethane. Thus, production methods which can avoid significant formation of by-products are sought.

The claimed invention addresses this problem by providing a process for preparing autocatalytic polyether alcohol comprising reacting an H-functional starter substance **having at least one catalytically active amino group and as least one group which is reactive with alkylene oxides**, with alkylene oxides comprising a step of **dissolving the starter substance in a solvent and reacting a solution with alkylene oxides**. Applicants have discovered that reaction of starter substance, which is **dissolved in a solvent**, as a solution with alkylene oxides provides for an autocatalytic polyether alcohol of narrow molecular weight distribution, low by-product content and which has low amine emissions when used to prepare a polyurethane (page 3, lines 31-33 and page 8, lines 16-24 of applicants' specification). Such a process is nowhere disclosed or suggested in the cited references of record.

The rejections of claims 1-4, 6, 7-18 and 20 under 35 U.S.C. § 103(a) over Schilling et al. U.S. 6,423,759 in view of Waddington et al. U.S. 2003/0100699, of claim 5 under 35

U.S.C. § 103(a) over Schilling et al. in view of Waddington et al. in further view of Maassen et al. U.S. 3,941,769, of claim 7 under 35 U.S.C. § 103(a) over Schilling et al. in view of Waddington et al. in further view of Nishioka et al. EP 376,602 and of claims 7, 9 and 19 under 35 U.S.C. § 103(a) over Schilling et al. in view of Waddington et al. in further view of Hinz et al. U.S. 5,476,969 are respectfully traversed.

None of the cited references disclose or suggest the claimed process of producing an autocatalytic polyether alcohol in which an H-functional starter substance **having at least one catalytically active amino group and at least one group which is reactive with alkylene oxides is dissolved in a solvent and reacted as a solution with alkylene oxides.**

Schilling et al. describe forming a polyether polyol by **suspending a solid** polyhydroxyl compound in an amine-initiated polyol, **heating the suspension** and alkoxyating **the heated suspension** (see abstract). The starter substance of the reference is not catalytically active. The amine-initiated polyol is describes as produced by any known method, and generally by alkoxyating the amine initiator, either with or without an alkaline catalyst, until the desired hydroxyl number has been attained (column 3, lines 43-47). The polyhydroxyl compound is normally solid at the processing conditions (column 2, lines 31-35). After the suspension of solid polyhydroxyl compound in the amine-initiated polyol is formed, the suspension is adjusted to a temperature of from 90 to 140°C, followed by alkoxylation (column 4, lines 18-23). A step of **dissolving** a starter substance having at least one catalytically reactive amino group and at least one group reactive with alkylene oxides, **in a solvent** is not disclosed.

In contrast, the claimed invention is directed to a process for preparing an autocatalytic polyether alcohol, by reacting an H-functional substance containing **at least one amino group which is catalytically active in the urethane reaction and at least one group which is reactive toward alkylene oxides**, by dissolving a starter substance in a solvent and

reaction the **solution** with alkylene oxide. Applicants have discovered that dissolution of the starter substance having at least one catalytically reactive amino group and at least one group reactive with alkylene oxides in a solvent provides for a narrow molecular weight distribution and suppression of secondary reactions. Since Schilling et al. fails to disclose or suggest a step of dissolving a starter substance which has **at least one amino group which is catalytically active and at least one group which is reactive toward alkylene oxides** the claimed invention would not have been obvious over Schilling et al.

Waddington et al. describes the preparation of an autocatalytic polyol in the absence of a solvent.

Waddington et al. makes no disclosure of any dissolving step of a starter substance having at least one catalytically reactive amino group and at least one group reactive with alkylene oxides in a solvent or a step of reacting a solution with alkylene oxide. The reference cites to U.S. 4,605,772 for a technique for preparing alkyl amines of Formula I, but there is no disclosure of dissolving a starter substance having at least one catalytically reactive amino group and at least one group reactive with alkylene oxides in a solvent or reacting a solution with alkylene oxides. In no case does the combination of references suggest **dissolving** a starter substance which is a H-functional starter substance containing at least one amino group which is catalytically active in the urethane reaction and at least one group which is reactive towards alkylene oxides, in a solvent nor reacting a solution with alkylene oxides.

Thus, the only reference which describes the preparation of an autocatalytic polyether alcohol, does so in the absence of a solvent. There is no suggestion of preparing an autocatalytic polyether alcohol in a solvent.

To the contrary, Schilling et al. describes that solvent use in the preparation of polyether polyols is to be avoided as such a solvent must be removed which consumes time

and energy. Thus, the evidence reflects that autocatalytic polyether alcohols have been prepared in the absence of a solvent, and that in general solvents should be avoided in the preparation of polyether alcohols.

Moreover even if the polyhydroxyl compound were dissolved in the amine-initiated polyol co-initiator, such a phenomena would not make obvious dissolution of a starter substance having at least one catalytically reactive amine **and** at least one group reactive towards alkylene oxides.

As noted above, the amine-initiated polyol is a co-initiator used along with a polyether polyol prepared by alkylene oxide addition to a polyhydric alcohol suspended in the amine-initiated polyol co-initiator. Thus, Shilling et al. at best, would suggest dissolution of a polyhydric alcohol, but not a compound having a catalytically reactive amine group.

Thus, since the cited references fail to suggest a step of dissolving a starter compound having a catalytically reactive amine group in a solvent, the claimed process would not have been obvious and withdrawal of the rejection under 35 U.S. C. 103 (a) is respectfully requested.

Moreover, applicants observe a reduction in odor for a polyurethane prepared as claimed by dissolving a starter substance with a catalytically active amine group in a solvent.

The examiner's attention is directed to examples 8 and 9 appearing on pages 10 and 11 of applicants' specification. Example 8 prepared with the autocatalytic polyol of example 2 (no solvent) was tested for VOC at 20 ppm containing dimethylamino groups. In contrast, example 9, prepared using autocatalytic polyol from example 3 (polyether alcohol solvent) was tested and no VOC was detected. Thus, applicants have demonstrated that an autocatalytic polyol as claimed produces a polyurethane of reduced VOC as compared with using an autocatalytic polyol prepared in the absence of a solvent. Such a result is not suggested by either of Schilling et al. or Waddington et al.

In view of the deficiencies of the cited references, the claimed invention is not rendered obvious by the cited combination of references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

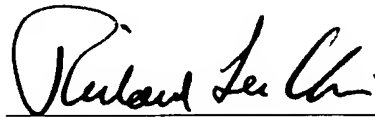
The rejection of claim 7 under 35 U.S.C. § 112, second paragraph has been obviated by appropriate amendment.

Applicants have now amended claim 7 to recite "said alkaline catalyst." In view of applicants amendment, withdrawal of this ground of rejection is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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